SECTION 01325
CONSTRUCTION SCHEDULE & PROGRESS DOCUMENTATION

(Construction value between $5M and $15M)

1 GENERAL

1.1 DESCRIPTION

A. This Section specifies the general requirements and procedures for preparing and submitting schedules for all Construction projects that have a value between $5 million and $15 million dollars.

B. Refer to Section 00700 – GENERAL CONDITIONS for requirements associated with Delay, Suspension of Work and Extension of time.

C. Refer to MBTA Project Controls Manual, latest Edition for standards and requirements that supplement this specification section.

1.2 SUMMARY

A. The Contractor is advised that its schedules and reports, as specified herein, will be an integral part of the Authority's management program. The Contractor's schedules will be used by the Authority to monitor project progress, plan the level-of-effort by its own Work forces and consultants, and as a critical decision-making tool. Accordingly, the Contractor shall ensure that it complies fully with the requirements specified herein and that its schedules are both timely and accurate throughout the life of the project. The Contractor's schedules shall be used by the Authority and Contractor for the following purposes as well as any other purpose where the issue of time is relevant.

B. This Section specifies the general requirements and procedures for preparing and submitting Contract Schedules and Progress Documentation to the Authority for review and acceptance. Included are:

1. Scheduler Requirements

2. Schedule Planning Session and Construction Phasing Plan

3. As-Planned Construction Schedules

   a. Baseline Schedule

   b. Proposed Revised Baseline Schedule

4. Progress Update Schedules

5. Time Impact Analysis (TIA) Schedules

1.3 SCHEDULE GLOSSARY

A. The following terms used in this Section or elsewhere in the Contract Documents shall have these meanings:

1. Activity – An element in the schedule highlighting or depicting a part of the Work and establishing the time for completing that part of the Work.

2. As-Built Schedule- A schedule showing all activities complete including Final Completion.

3. As-Planned Schedule/Baseline Schedule - Construction Schedule Revision 0 (Rev. 0) Submittal returned by the Authority to the Contractor as “Accepted as Submitted” or “Accepted as Noted,” with or without comments or objections noted, showing the contractor’s plan to complete the Work within the Contract Time. As-Planned and Baseline may be used interchangeably and shall have the same meaning.

4. Construction Schedule - Schedule which shows the Contractor’s approach to planning, scheduling, and execution of the Work.

5. Contract Float - Number of Calendar Days between the Contractor’s anticipated date for early completion of all or part of the Work and the corresponding Contract Time or Contract Milestone(s). Contract Float is further defined as the amount of time any given activity or path of activities may be delayed before it will affect the Contract Time.

6. CPM - The Critical Path Method of planning and scheduling. References to the Critical Path Method (CPM) shall be to CPM construction industry standards that are consistent with this Section.

7. Critical Path - Any continuous sequence of Activities in the schedule that controls achievement of a corresponding Contract Time or Milestone(s).

8. Data Date- The data up to or through which the project’s reporting system has provided actual status and accomplishment.

9. Days - Refer to Section 00700, General Conditions.

10. Delays - Slippage of the dates in any Progress Schedule Submittal which forecast any slippage or overrun of Milestone(s) or Contract Times.

11. Early Completion Schedule - A CPM schedule showing completion of the Work ahead of the Contract Time.

12. Early and Late Dates - Early times and late times of performance for the Activities as defined by CPM techniques.

13. Fragnet – A Fragnet is defined as a sequence of new activities and for activity revisions that are proposed to be added to the existing

schedule to demonstrate schedule impact and the method for incorporating changes into the schedule as they are encountered.

14. Milestone - A key event (zero duration) established in the Construction Schedule and as specified in the Contract Documents (e.g., Notice to Proceed, Substantial Completion, Final Acceptance).

15. Notice to Proceed (NTP) - The date when the Contract commences.

16. Out of Sequence – When an activity starts or finishes before its predecessor.

17. Proposed Revised Baseline Schedule - A working schedule with changes made to the As-Planned Schedule, which has not yet been accepted by the Authority.

18. Schedule Meeting - Meeting to review the Contractors Schedule. Typical Schedule meetings are further defined in Section 1.14.

19. Schedule Narrative – A descriptive report submitted with each schedule.

20. Schedule of Values – A listing of elements, systems, items, activities or other subdivisions of the work, establishing a value for each, the total of which equals the contract sum.

21. Schedule Recovery – A schedule that forecasts substantial completion by either the original completion date, or some other date that is earlier than the current projected completion date reflected in the most recent update.

22. Time Impact Analysis (TIA) – Process of quantifying and apportioning the effect of delay or change on a project schedule.

23. Workday - Any day contract Work is to be performed.

B. Other terms used in this Section shall have the meanings assigned to them elsewhere in the Contract Documents, and if not assigned and where the context will permit, as used or defined in Massachusetts General Laws (M.G.L.).

1.4 SCHEDULER REQUIREMENTS

A. The name of the Project Scheduler(s), together with his/her qualifications, shall be submitted to the Authority for approval within 10-days of Notice of Award. A Project Scheduler shall have a minimum of three [3] years of project CPM scheduling experience, two [2] years of which shall be on projects of similar scope and value of this project.

B. The project scheduler(s) shall develop and maintain all schedule information, attend meetings to represent the contractor and provide all required submittals on behalf of the contractor.

1.5 BASELINE CONSTRUCTION SCHEDULE REQUIREMENTS

A. GENERAL

1. The Contractor’s approach to prosecution of the Work shall be disclosed to the Authority by submission of the computerized construction schedule required in this Section.

2. The Contractor has the responsibility to incorporate the Subcontractors and Suppliers input into the schedule for activities, logic ties, etc. involving their Work.

3. The utilization of secondary schedules (those other than the Baseline Schedule or Progress Schedule Submittals) is prohibited.

4. The construction schedule shall clearly define the prosecution of the Work from Notice to Proceed to final completion by using the CPM method. Logic ties shall be realistic to show the Contractor's Work sequencing. The schedule shall include activities for, but not limited to:

   a. Contract Milestones (Substantial Completion, Final Completion, etc.)

   b. Subcontractor selection and approval,

   c. Submittal preparation, reviews, resubmissions and approval,

   d. Material and Equipment procurement, fabrication and/or delivery,

   e. Mock-ups if required by the technical specifications,

   f. Authority furnished items,

   g. Permitting

   h. Milestones (including NTP, Substantial Completion, and Final Acceptance)

   i. Identify all construction activities that require access to the Right-of-Way and MBTA operational support.

   j. Interfaces with other contractors, and/or Public Utilities,

   k. Construction activities,

   l. Testing and commissioning,

   m. Punch List

   n. Required inspections by Authorities Having Jurisdiction (AHJ)

   o. Final Inspection,

   p. Certificate of Occupancy

q. Authority training and move-in

5. Once the Baseline Schedule is returned to the Contractor as "Accepted as Submitted" or "Accepted as Noted", it shall become the As-Planned Schedule of record. Once established, the As-Planned Schedule shall be used as the basis for Monthly Schedule Submittals.

6. Proposed changes to the As-Planned Schedule/Baseline Schedule, initiated by the Contractor, shall be presented to the Authority as a Proposed Revised Baseline Schedule for review (see Section 1.8).

7. In order to comply with all technical schedule requirements, use of the MBTA-provided schedule template is encouraged. Use of the template shall not relieve the Contractor from compliance with all schedule requirements.

8. Acceptance of the construction schedule by the Authority shall not relieve the Contractor from compliance with the requirements of the Contract Documents or result in the approval of any variation from the Contract Documents.

B. Technical – Work Breakdown Structure

1. The Work Breakdown Structure shown below shall be utilized to the fullest extent possible.

- -Project
  - Contract Milestones
  - Subcontractors
  - Procurement
    - Heading for Each Specification Section/Submittal
  - Change Orders
    - Heading for Each RFI/PCO/CO
      - Subheading for initial event through MBTA approval
      - Subheading for procurement
        - Subheading for Each Specification Section/Submittal
      - Subheading for Construction (to be further sectioned as appropriate)
  - Construction
    - Subheadings and Breakdown per Contractor's Construction Phasing Plan
      - Additional Breakdown as appropriate to manage project
  - Closeout
  - Allowance and Unit Price items

C. Technical – Activity Requirements

1. Activities shall be sufficiently detailed to manage the work. They shall be limited to work for:

a. A single responsible party. Work being performed by DBE firms shall be identified as separate CPM activities.

b. A single work action (to breakout distinct classes of Work: e.g., CSI Divisions/Sections or equivalent)

c. A single location

2. Activity durations shall equate to the Workdays required to complete the Work included in each Activity

a. Activity durations for construction or installation activities shall not exceed thirty (30) calendar days unless otherwise approved by the authority.

b. Activity durations for submittal review activities shall be thirty (30) Calendar Days unless different review times are specified in other sections of the Contract Documents.

c. Activity durations for non-construction activities, such as mobilization, procurement of materials, and delivery of equipment, shall represent the best estimate of time required.

3. Activities shall be assigned consistent identification codes and descriptions.

a. Activity identification codes shall be unique. It shall be structured such that it relates to the area and location of the work.

b. Activity descriptions shall be unique. They shall describe to the scope of the detailed work for that activity and be structured as “Verb Noun Location.”

4. Activities shall be assigned sort codes from the MBTA global activity code list and values for the MBTA UDF’s per the requirements in the Project Controls Manual, latest edition, Primavera Settings. Codes and UDFS are established to group activities into meaningful organizations by, at a minimum:

a. Location

1. Area (UDF)

2. Type of Space (Code)

3. Transit Line & Direction (Code)

b. Responsibility (Code)

c. Ops Support Required (Code)

d. Construction Stage-Phase (Code)

e. Milestones (Code)

f. MBTA: Work Type (Code)

1. MBTA: CSI Level (Code)

g. Bid Item

h. Changes

1. DCR (UDF)

2. RFI# (UDF)

3. PCO / CO (Change Order #) (UDF)

i. NCR / Non-Conformance Report (UDF)

5. Additional, optional, MBTA global activity code list and values for the MBTA UDF's include:

a. Quantity and Unit information

1. Quantity (UDF)

2. Unit of Measurement (UDF)

b. Additional User Defined Fields

1. User Indicator 1 (UDF)

2. User Number 1 (UDF)

3. User Number 2 (UDF)

4. User Text 1 (UDF)

5. User Text 2 (UDF)

D. Technical – Use of Logic and Sequencing

1. The Contractor shall seek approval and provide justification for the use of logic 'lags.' 'Negative lags' are not allowed.

E. Technical – Adverse Weather Planning

1. The schedule submittal to the Authority must include planning for adverse weather if applicable. Planning for adverse weather is the strategy used to develop a schedule that produces reasonable and historically consistent early start dates. If applicable, it is reasonable to conclude that adverse weather conditions will be expected for a specific project in a specific location during a specific time frame.

2. The contractor shall include a schedule activity entitled “Adverse Weather Days Allowance” that is the total number of days as calculated from the Number of Anticipated Adverse Weather Days per Month table included in this section. The Adverse Weather Days Allowance shall be the only immediate predecessor to Substantial Completion.

NUMBER OF ANTICIPATED ADVERSE WEATHER DAYS PER MONTH

Month	JAN	FEB	MAR	APR	MAY	JUN	
Mon-Fri		5	4	2	1	0	0
Sat-Sun		2	1	0	0	0	0
=							
TOTAL	7	5	2	1	0	0	

Month	JUL	AUG	SEP	OCT	NOV	DEC	
Mon-Fri		0	0	1	1	1	2
Sat-Sun		0	0	0	0	0	1
=							
TOTAL	0	0	1	1	1	3	

3. Weather events consist of adverse weather conditions occurring within the work hours that affect specific weather sensitive activities resulting in a forced shut down of 50% or more of the project, the workday, or personnel.

4. In order to utilize the days allocated for adverse weather the Contractor must provide the Authority evidence of excessive weather conditions from NOAA (National Oceanic Atmospheric Administration).

5. Upon approval by the Authority, the Contractor shall insert an activity in the sequence of the work with the approved Adverse Weather duration and then reduce the same duration from the Adverse Weather Allowance activity.

6. If the quantity of days in the Adverse Weather Allowance activity is exhausted, the Contractor is required to submit a TIA requesting additional days when they are realized. See Paragraph 1.9 E.

F. Baseline Schedule Narrative

1. The Baseline Narrative shall communicate to the Authority the Contractor's progress and plan for performing and completing the Work and include details regarding:

a. Plan and approach to sequencing of the Work including:

i. Identifying Work items and Critical Path(s) to completion, including non-critical work associated primarily with those paths, required for timely completion

ii. Other (Non-Critical) Path(s) to completion.

iii. Critical submittals by the Contractor for the Authority's review

iv. The use of construction equipment and resources

v. The level of MBTA support expected to execute the schedule.

vi. Compliance with the limitations of operations, including

b. Winter weather requirements and adverse weather

c. Any shifts non-Workdays and multiple calendars applied to the activities

d. Definition of key schedule components, including:

i. Calendar

ii. Glossary of Terms and Abbreviations used in the Contract Schedule.

2. All Baseline Narrative tables in excess of five rows shall be included in a separate exhibit or appendix as tabular data tables. (E.g., as delimited text or spreadsheet files).

1.6 SCHEDULE OF VALUES

A. A Schedule of Values depicting the allocation of costs for items in proportion to the scope of work as defined in the Contractor's bid shall be prepared by the Contractor.

1. The individual items in the schedule of values should not exceed $100,000 unless otherwise approved by the Authority.

2. No costs shall be applied to preparation of submittals with the exception of preparation of engineered shop drawings or complex shop drawings if approved by the authority.

3. The contractor shall provide written quotes from subcontractors, vendors and suppliers to the Authority upon request.

1.7 PROGRESS UPDATE SCHEDULE REQUIREMENTS

A. The Contractor shall utilize the current Baseline Schedule, accepted Proposed Revised Baseline Schedule or the previous months accepted Progress Schedule to monitor progress against. Confirmation of which schedule is to be used in recording progress shall be obtained from the Authority.

B. The monthly Progress Update Schedule process consists of three steps:

1. Step 1 – perform update to the schedule that the Authority has determined to be used.

   a. The schedule shall be limited to progress up to the last calendar day of each month.

   b. The contractor shall not artificially improve its progress by revising schedule logic, relationships, or shortening planned activity durations; however, changes which do not significantly alter the Baseline Schedule, but are necessary to accurately forecast and plan upcoming work, will be proposed and agreed at the Schedule review meeting along with any other logic changes to correct out-of-sequence work and the Fragnet Matrix.

   c. Default progress data is not allowed. Actual start and finish dates shall not be automatically updated by default mechanisms that may be included in the CPM scheduling software systems. Actual start and finish dates, physical percent complete, and remaining duration on the CPM schedule shall match those dates provided from the Contractor back up paperwork (i.e., daily field reports, delivery slips, etc.).

   d. The contractor shall only utilize "Retain Logic" (schedule calculation).

   e. Prepare and hold the XML files that will become part of the full monthly report submittal.

   f. Prepare a matrix of all Fragnets that the Contractor proposes to be included in the monthly update. The matrix will include Fragnet ID number, initiating contract action (e.g., Work Directive, RFI response, Differing Condition, …), date of the initiating event, description, predecessor ID, predecessor total float, successor ID, successor total float, comments.

2. Step 2 – Review Fragnet matrix with the Authority.

   a. The contractor shall attend a Schedule review meeting no later than 5-days after the closing day of the month with the Authority to review and agree on the Fragnets to be included in the Progress Update Schedule. The Matrix shall be provided 2-days ahead of the meeting.

3. Step 3 – Complete monthly Progress Update Schedule

a. Add Fragnets that were discussed and agreed with the Authority to the Progress Update Schedule.

b. Add logic changes to correct out-of-sequence work activities that were discussed and agreed with the Authority.

c. Add other logic changes that do not significantly alter the Baseline Schedule, that are necessary to accurately forecast and plan upcoming work. Any logic changes will be included in the narrative section of the monthly Progress Update Schedule Report.

d. Prepare XML files to be part of the submittal. The Final Progress Update XML file will include one Progress Only XML and one Final Progress Update XML file (with approved changes per the Matrix and other logic changes discussed and agreed with).

e. Complete Progress Update Schedule report.

C. The Monthly Progress Schedule shall be reviewed by the Authority to determine disposition.

D. Should the Monthly Progress Schedule indicate that the progress of the Work falls behind the contractual milestones for reasons other than those that are excusable within the terms of the contract, the Contractor shall implement a plan to recover the schedule. The requirements for a recovery plan are more fully defined in Section 1.11. The recovery plan shall be submitted within (15) days after the contractor is notified and shall be in the form of a Proposed Revised Baseline Schedule, including all required narratives and reports.

D. Progress Update Narrative

1. The Progress Update Narrative shall communicate to the Authority the Contractor's planned and actual progress completing the Work during the update period. It shall include:

a. Overall update summary that includes changes to projected contractual and non-contractual (tracking) milestones dates.

b. Overview of progress and changes since the last submittal and discussion of potential and actual delays.

c. A matrix summary of:

i. The quantity of planned activity starts, actual activity starts, and the percent actual vs. planned starts.

ii. The quantity of planned activity finishes, actual activity finishes, and the percent actual vs. planned finishes.

d. A matrix summary of all Fragnets that the Contractor has included in the monthly update. The matrix will include Fragnet ID number, initiating contract action (e.g., Work Directive, RFI response, Differing Condition, …), date of the initiating event, description, predecessor ID, predecessor total float, successor ID, successor total float, comments.

2. Planned work during the update period. This should be presented as a summary level description, per the contract phasing plan, with additional detail as needed.

a. Indicate which phases contained critical or near-critical paths.

b. Indicate, by phase and path, how much of the planned work was completed.

c. Indicate, by phase and path, how much of the planned work was not completed

3. Unplanned work during the update period. This should be presented as a summary level description, per the contract phasing plan, with additional detail as needed.

a. Indicate work planned for future periods that was accelerated into this period.

b. Describe any work not in the schedule that was completed. This work will need to be incorporated into future schedules using the draft schedule process.

4. Risks and issues encountered and/or resolved during the update period. This should include an explanation for why planned activities were not completed and what work-around activities were required to resolve the issue

5. Documentation of adverse weather days experienced during the update period.

6. Documentation of out-of-sequence work, per the Primavera Schedule Log (or equivalent)

a. Note items added due to unplanned work, including the phase per the contract phasing plan. Indicate if these are expected to resolve (e.g., due to completion) in the next update period

b. Note items and phases, per the contract phasing plan, which have been retained from previous updates.

7. Planned work during subsequent update periods.

a. Summary of planned work; organized per the contract phasing plan, with additional detail as needed

b. Changes to the critical and near critical paths, organized and presented within the context of the contract phasing plan.

c. Critical submittals by the Contractor for the Authority's review

d. Any potential/future/pending changes in access to or availability of Work areas

e. Upcoming phased or total takeover by Authority.

8. Changes (or lack thereof) to planned phasing or sequencing due to progress this period.

a. Verify the future sequencing accurately represents the project plan.

9. All Progress Update Narrative tables in excess of five rows shall be included in a separate exhibit or appendix as tabular data tables. (E.g., as delimited text or spreadsheet files).

1.8 PROPOSED REVISED BASELINE SCHEDULE

A. A Proposed Revised Baseline Schedule shall be submitted by the contractor after receiving notification of its requirement by the Authority within the following time periods; five (5) days after approval of a Time Impact Analysis for Changes in the Work, Extra Work and Delays; and fifteen (15) days for a recovery plan. Proposed Revised Baseline Schedule submittals may additionally be submitted at the contractor's discretion (i.e., concurrently with the corresponding progress update schedule). The Proposed Revised Baseline Schedule submittal shall include the Proposed Revised Baseline Schedule, the Schedule Narrative, and the Schedule Reports.

1. The review of the Proposed Revised Baseline Schedule submittal by the Authority does not assess source of delays. A separate Time Impact Analysis (TIA) shall be submitted as specified in Section 1.9 to identify source of delays and if an Extension in Contract Time is warranted.

2. The review of the Proposed Revised Baseline Schedule submittal by the Authority does not determine time entitlement associated with Changes in the Work or Extra Work. A separate Time Impact Analysis (TIA) shall be submitted as specified in Section 1.9 to determine if an Extension in contract time is warranted for Changes in the Work or Extra Work.

3. The accepted Proposed Revised Baseline Schedule submittal shall become the new As-Planned Baseline Schedule for future monthly progress schedule.

B. All changes that occurred from the previously accepted Monthly Progress Schedule, and not currently submitted to the Authority for acceptance shall be recorded only on the Proposed Revised Baseline Schedule submittal.

C. The Proposed Revised Baseline Schedule submittal shall incorporate all proposed activity and logic revisions required to accomplish the following:

1. Implement changes in the Work.

2. Detail all impacts on pre-existing Activities.

3. Show Recovery Schedule.

4. Reflect the Contractor's proposed approach for remaining Work.

5. Incorporate substitution proposals; and

6. Incorporate Potential Change Orders, Work Directives, RFI's and Non-conformance.

D. Other types of changes to the Project Schedule may include, but not limited to the following:

1. Added/Deleted activities.

2. Original Duration changes.

3. Assigned calendars.

E. The Proposed Revised Baseline Schedule Narrative shall communicate to the Authority:

1. The reason(s) for the creation of the Proposed Revised Baseline Schedule.

2. All changes from the last approved Baseline or Proposed Revised Baseline Schedule with respect to both completed and remaining work for:

a. The approach to sequencing of the Work including:

i. Identifying Work items and Critical Path(s) to completion, including non-critical work associated primarily with those paths, required for timely completion.

ii. Other (Non-Critical) Path(s) to completion.

iii. Critical submittals by the Contractor for the Authority's review

iv. The level of MBTA support expected to execute the schedule.

v. Compliance with the limitations of operations, including

b. Changes to calendars or adverse weather

1.9 TIME IMPACT ANALYSIS REQUIREMENTS

A. Any Contractor request for Extension in Contract Time due to Changes in the Work, Contractor Proposed Changes, or a Delay beyond their control will not be evaluated unless (a) the Contractor demonstrates that conditions justifying an Extension in Contract Time have arisen, and (b) the Contractor's analysis is verifiable through an independent review of the Time Impact Analysis (TIA) by the Authority.

B. Determination and Extension of the Contract Time will be in accordance with Section 00700 GENERAL CONDITIONS. In order for an Extension in Contract Time to be considered, the Contractor shall demonstrate that the critical path was adversely affected.

C. The Extension of Contract Time shall be considered only if the Contractor is able to demonstrate merit of the impact to the critical path using Forward-Looking Analysis (prospective) Methodology or Window Analysis (retrospective) Methodology. The Contractor, Designer and MBTA shall hold a meeting to discuss and agree on the methodology to be used in both the preparation and review of the TIA.

D. A Time Impact Analysis (TIA) shall be submitted for Changes in the Work and Extra Work to document how the new activities associated with the Changes in the Work or Extra Work are integrated into the schedule and the current approved Baseline Schedule. The review of the Contractors TIA may determine that the work can happen concurrently with the current approved Baseline Schedule and that an Extension of Contract Time is not required to complete the Changes in the Work or Extra Work.

E. The Contractor's failure, refusal or neglect to comply with the requirements specified in this Section shall be reasonable evidence that the Contractor is not prosecuting the Work with due diligence. If faced with such a situation, the Authority may direct schedule recovery (see Section 1.11).

F. Weather Impacts

1. In order for the Authority to grant a time extension for weather, the following conditions must be satisfied.

    a. The weather experienced at the project site during the contract period must be found to be unusually severe, that is, more severe than the adverse weather anticipated for the project location during any given month as discussed in 1.5 E. If the number of actual adverse weather delay days exceeds the number of days anticipated in paragraph 1.5 E, the Authority will convert any qualifying delays to calendar days and issue an Extension in Contract Time.

    b. The number of actual adverse weather delay days shall include days impacted by actual adverse weather calculated chronologically from the first to the last day of each month and be recorded as full days.

c. The sign-off from the MBTA (Resident Engineer or Inspector) confirming the days requested.

2. Actual adverse weather delay days must prevent Work on critical activities for 50-percent or more of the Contractor's scheduled workday.

3. The unusually severe weather must actually cause a delay to the completion of the project. The delay must be beyond the control and without the fault or negligence of the Contractor.

4. The daily field report must substantiate the adverse weather day by documenting both the weather condition and the impacted work.

1.10 USE OF FLOAT

A. Contract Float is not for the exclusive use or benefit of either the Authority or the Contractor, but must be used in the best interest of completing the project within the Contract Time.

B. Sequestering of float shall be cause for non-acceptance of the contractor's schedule submittal. In the event that float sequestering is identified, the schedule shall be revised appropriately. The Contractor shall not utilize the following:

1. Float suppression techniques in the Construction Schedule, including but not limited to interim dates imposed by the Contractor other than Contract Time(s) and Contract Milestone(s).

2. Inclusion of activities or constraints in a path or chain leading to a Contract Milestone which are unrelated to the Work as stated and specified in the Contract Documents.

3. Activity durations or sequences deemed by the Authority to be unreasonable in whole or in part.

4. Artificial Activity Durations; and

5. Misrepresentation of work hours specified in project calendars.

C. All Contract Time(s) and Milestones shall be imposed, coded and separately identified in all Progress Schedule Submittals in conformance with the Milestone(s) and Contract Time(s) set forth in the Contract Documents. The Contractor shall impose no other date constraints in the construction schedule, unless an explanation of their basis is provided and is acceptable to the Authority.

D. If the dates in any Progress Schedule Submittal forecast any slippage or overrun of the Contract Times, the Contractor shall indicate such slippage or overrun by reporting negative Contract Float.

E. If the Contractor is delayed in performing the Work, the Contractor shall utilize Contract Float to absorb any related delay, disruption, interference, hindrance, or extension, however caused, until all Contract Float is consumed. The Contractor shall work cooperatively with the Authority,

adjacent contractors, and third parties, to identify and implement to the maximum extent possible, no-cost measures to mitigate all schedule delays, regardless of the cause of the delays.

1.11 SCHEDULE RECOVERY

A. Should the progress of the Work fall behind the contractual milestones for reasons other than those that are excusable within the terms of the contract, the Contractor shall implement a plan to recover the schedule. The plan must detail how the impact will be mitigated through the use of activity re-sequencing, adding additional crews, longer work hours, extra workdays, etc., at no cost to the Authority. The recovery plan must be in the form of a Proposed Revised Baseline Schedule and meet all of the requirements identified in Section 1.8.

1.12 SCHEDULE ACCELERATION

A. Acceleration occurs when an owner (MBTA) directs a contractor to complete work earlier than a contractual milestone date or as modified in accordance with an approved time extension.

B. Ten (10) business days prior to negotiations with the Authority, the Contractor shall provide a schedule for acceleration of remaining work and all supporting documents including, but not limited to the following:

1. Identify activities to be accelerated
2. Identify proposed calendar(s)
3. Identify proposed crew(s)
4. Identify proposed duration changes
5. Identify proposed logic changes
6. Provide narrative with basis of assumption
7. Identify cost for acceleration

1.13 SUBMITTALS

A. Schedule Submittals, General

1. The Contractor shall use Oracle Primavera P6 Professional Project Management (P6) or P6 Enterprise Project Portfolio Management (P6 EPPM) Scheduling Software for all schedules.

2. All schedule files shall be submitted in .XML format suitable for import into the MBTA's Oracle Primavera P6 EPPM Database and include/maintain MBTA-specific global scheduling data (such as resource hierarchies, project- and activity- codes and user-defined fields).

3. All tables in excess of five rows shall be included in a separate exhibit or appendix as tabular data tables. (E.g., as delimited text or spreadsheet files).

4. Submit all schedules, associated narratives, reports and other documentation using the MBTA's Project Management Information System's (PMIS) Schedule Deliverable Process (MBSDP). Access to the MBTA's PMIS will be arranged through the PMIS group. Contractors can request access through the MBTA Project Manager.

5. All submissions relating to planning, scheduling, coordination, and reporting of the project status shall include the name(s) of the Project Schedulers preparing the submission, as well as the name(s) of any other contributors.

6. If any of the required schedule submissions, in this Section, are returned to the Contractor for corrections or revisions, they shall be resubmitted, along with an electronic file, for acceptance within ten (10) calendar days after the return.

B. Scheduler Qualifications

1. The name of the Project Scheduler(s), together with his/her qualifications, shall be submitted to the Authority for approval within (10) days of the Notice of Award using the MBTA's Project Management Information System (PMIS). Include, for each scheduler:

   a. Resume clearly demonstrating years of CPM scheduling experience

   b. Project list demonstrating work on projects of similar scope and value of this project. Include the project name, a short description, start and end dates worked (may be rounded to nearest month), and type of work performed.

C. Construction Phasing Plan

1. The Construction Phasing Plan shall be due on the date of the Schedule Planning Session.

2. The construction phasing plan shall be presented at a summary level using a Gantt Chart or Flowchart of construction phases or submittals.

   a. The construction phasing plan shall indicate the expected critical path.

   b. The construction phasing plan shall include the full scope of work.

3. A memo describing the overall approach in the phasing plan, as well as information not shown on the construction phasing plan

4. If a simple Gantt chart is used (i.e., no relationship between phases is shown) the memo must describe the logical conditions/relationships between project phases

5. If a flowchart is used (i.e., time is not represented within the chart) the memo must include an estimate of time for the construction phases.

D. Baseline Submittal

1. The Baseline Schedule Submittal shall be due within thirty (30) days after the Notice to Proceed, and shall include the Baseline Schedule, the Baseline Schedule Narrative, and the Schedule Reports listed below.

2. Construction Phasing Plan as defined in Section 1.13 C.

3. Schedule Printout consisting of a PDF file showing the bar chart with durations, total float and dates arranged by WBS and in other reporting details. The schedule shall be sorted by Early Start.

4. Activity Report shall include Activity ID, description, duration, calendar, Early Dates, Actual Dates, and Late Dates, Total Float and sort codes as specified by the Authority. The Late Finish Date of any Activity representing a Milestone shall equal the corresponding Contract Time. In addition, Activity reports shall show, for each Activity, all preceding and succeeding driving logic ties or attach a separate report combining such Activity and logic tie data.

E. Schedule of Values

1. The Schedule of Values shall be due within thirty (30) days after the Notice to Proceed and shall be submitted in the native spreadsheet file.

F. Progress Update Submittal

1. Monthly Progress Update Submittal shall consist of the following:

a. Within five (5) Days after the closing date of the month, and within 2-days of the monthly schedule review meeting, transmit the matrix of proposed Fragnets that the Contractor seeks the Authority’s acceptance as described in Step 1 in Section 1.7 B.

b. A complete Monthly Progress Update Submittal shall be due within ten (10) Days after the closing date of the month. The submittal shall include all of the content as detailed in Section 1.7 including the Step 1 and Step 3 Schedules, the Progress Update Narrative, and the Schedule Reports listed below. When submitting via e-Builder, use the final update (with Fragnets) as the basis of the submittal. Include the progress only schedule as an attachment.

2. Schedule Printout consisting of a PDF file showing the bar chart with durations, total float and dates arranged by WBS and in other reporting details. The schedule shall be sorted by Early Start.

3. Activity Report shall include Activity ID, description, duration, calendar, Early Dates, Actual Dates, and Late Dates, Total Float and sort codes as specified by the Authority. Activity reports shall show, for each Activity, all preceding and succeeding driving logic ties or attach a separate report combining such Activity and logic tie data.

G. Proposed Revised Baseline Schedule Submittal

1. A Proposed Revised Baseline Schedule shall be submitted by the contractor after receiving notification of its requirement by the Authority within the following time periods; five (5) days after approval of a Time Impact Analysis (TIA) for Changes in the Work, Extra Work and Delays; and fifteen (15) days for a recovery plan. Proposed Revised Baseline Schedule Submittals may additionally be submitted at the contractor's discretion. The Proposed Revised Baseline Schedule submittal shall include the Proposed Revised Baseline Schedule, the Schedule Narrative, and the Schedule Reports listed below.

2. Construction Phasing Plan

3. Schedule Printout

4. Activity Report shall include Activity ID, description, duration, calendar, Early Dates, Actual Dates, and Late Dates, Total Float and sort codes as specified by the Authority. Activity reports shall show, for each Activity, all preceding and succeeding driving logic ties or attach a separate report combining such Activity and logic tie data.

H. Time Impact Analysis (TIA) Submittal

1. A Time Impact Analysis (TIA) must be submitted within thirty (30) days of the request by the Authority for Change Order Proposal that includes any proposed extension in contract time that result from Changes in the Work.

2. A Time Impact Analysis (TIA) must be submitted within fourteen (14) days of the issuance of a Work Directive Letter (WDL) if the WDL will require any proposed extension in contract time.

3. A Time Impact Analysis (TIA) for Changes not initiated by the MBTA, the Contractor must provide written notice within fourteen (14) days of the event giving rise to the change followed by a TIA within thirty (30) days from the notice.

4. Time Impact Analysis (TIA) Submittals shall include all relevant Fragnets, schedules, the TIA Narrative, and additional reports as listed below.

5. Detailed CPM Schedules clearly delineating the impact to the critical path. All schedules referenced in the Window's analysis must be included.

5. Fragnet demonstrating how the change issue or event impacts the last accepted Progress Schedule Update and critical path.

6. The TIA Narrative shall:

a. Clearly describe the events causing the impact

b. Substantiate the impact using Window Analysis Methodology.

c. Propose a course of action for mitigating any schedule delays including:

i. Plan and approach to sequencing of the Work

ii. Any significant change to resources for completed, current, and forecasted Work

iii. Calendar

iv. Logic

7. A matrix showing the Change in the Work or Delay, its source, the corresponding number of days that impact the critical path, and a contractor's comments column where the contractor shall indicate if the time is excusable or non-excusable.

8. Any additional information reasonably requested by the Authority that is needed to perform the review of the Contractor submitted TIA.

I. Look Ahead Schedules

1. The contractor shall provide look-ahead and look-back schedules at each progress meeting. Each look-back and look-ahead Schedule shall display the activities planned as of the date of the meeting that cover the previous two (2) weeks and the next two (2) weeks. The look-back and look-ahead schedules shall be filtered reports from the most recent approved schedule (Baseline, Proposed Revised Baseline, or Update Schedule). Additional details beyond the filtered activities that support each construction activity can be presented in and Excel report.

1.14 MEETINGS

A. Schedule Planning Session – This will be an interactive session, to discuss procedures associated with schedule and cost, as well as the contractor's planned approach to the project

1. Timing: Within fifteen (15) days after Contract award, and prior to submission of the baseline construction schedule.

2. Attendance: The Contractor shall anticipate requiring the attendance of key members of the Contractor's project team including the Project Manager, Site Supervisor (Superintendent) and Construction Scheduler.

3. Agenda:

   a. The Authority shall discuss procedures associated with schedule.

   b. The Authority will review the requirements for the various schedules to be submitted, the coding, formatting and P6 settings.

   c. The Contractor shall present its planned approach to the project including:

      i. The planned construction sequence and phasing.

      ii. Identification of Work to be self-performed and sub-contracted.

      iii. A listing of all key submittals with an initial priority rating for each of them.

      iv. Estimated durations of major work activities.

      v. The anticipated critical path of the project; and

      vi. A summary of the most difficult schedule challenges the Contractor is anticipating and how it plans to manage and control those challenges.

   d. The Contractor shall answer all questions that the Authority and its Consultants may have.

4. The Engineer shall provide copies of a written summary of the information presented and discussed during the session to the attendees.

B. Schedule Update Meeting – A meeting to discuss and agree on monthly schedule progress.

1. Timing: To be held monthly within 5-days of the closing day of the month. The Contractor, Designer and MBTA Field Staff meet to discuss and agree on monthly schedule progress and the Fragnets to be included in the update.

2. Attendance: The Contractor shall anticipate that key members of the Contractor staff including but not limited to the Project Manager, the Site Supervisor (Superintendent), the Construction Scheduler and a representative of the key sub-contractors (as determined by the Engineer), shall attend each of these meetings.

3. Agenda: The contractor, consultant, MBTA Field and Project Management Staff will discuss and agree on monthly schedule progress

4. This meeting is to be separate from the Job Progress Meetings and separate from the Work-Off List Meeting.

C. Proposed Revised Baseline Schedule Workshop – A meeting to discuss the changes incorporated into the Proposed Revised Baseline Schedule.

1. Timing: To be scheduled by the authority within fifteen (15) days of the Proposed Revised Baseline Schedule submission.

2. Attendance: The Contractor shall anticipate requiring the attendance of key members of the Contractor's project team including the Project Manager and Construction Scheduler and a representative of the key sub-contractors (as determined by the Engineer).

3. Agenda: The contractor, consultant, MBTA Field and Project Management Staff will discuss the changes incorporated into the schedule. This includes, at a minimum, all

a. schedule impacts,

b. recovery plan,

c. change order schedules (TIA),

d. Fragnets,

e. plan vs. current performance,

f. manpower,

4. For contractor initiated Proposed Revised Baseline Schedules, submitted concurrently with the progress update schedule, this meeting may be appended to the Monthly Schedule Update Meeting.

D. TIA Meetings – A pre-submittal meeting will be held to ensure the Contractor understands the contents and technical requirements of the TIA. The Contractor, Designer and MBTA will also discuss and agree on the TIA methodology to be used in the preparation and review. A second meeting between the contractor, Authority project staff, and MBTA Project Controls shall be held to thoroughly review, analyze, and resolve each alleged impact.

E. Progress Meeting – A bi-weekly meeting between the Contractor, Authority project staff, and Designer to review and discuss progress of the work. The Contractor shall provide a look back and look ahead schedule for discussion at the meeting.

F. Work-Off List Meeting –

1. Timing: Work-off List Meetings are required when projects are four (4) months from a major Milestone, opening or Substantial Completion per the following intervals:

   a. 4 to 2 months prior – Work-off meetings will occur once a week.

   b. 2 to 1 month prior – Work-off meetings will occur 2 times per week.

   c. 1 month prior – Work-off meetings will occur 3 times per week.

2. Attendance: Contractor (consisting of no less than the Project Manager, the Site Supervisor, the Office Engineer, and the Construction Scheduler), and every key sub-contractor (as determined by the Authority)

3. Agenda: The contractor, required subcontractors, Authority representatives, and the Authority's Designer of Record review the Work-off List, including:

   a. the detailed status of each Work activity and sub-Work activity

   b. the specific details of the Work that remains to be completed,

   c. the interdependencies within each area and crew,

   d. the remaining approvals and inspections,

   e. The requirements to obtain certificate of occupancy.

1.15 Measurement and Payment

A. MEASUREMENT

1. No separate measurement will be made for the work of this section.

B. PAYMENT

1. No separate payment will be made for work of this section.

C. PAYMENT ITEM

Item No.	Description	Unit
0130.168	ALL OTHER WORK	LS

END OF SECTION